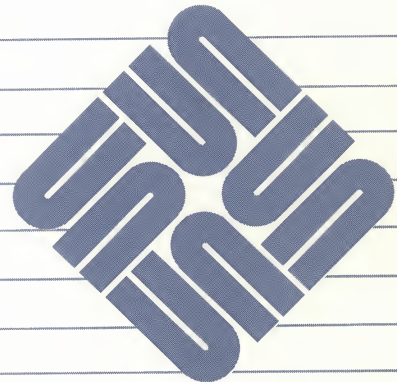




Guide to Sun System Software Documentation



Part No: 800-3855-10
Revision A of 26 September 1989






Guide to Sun System Software Documentation

Sun Microsystems • 2550 Garcia Avenue • Mountain View, CA 94043 • 415-960-1300

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Preface

This booklet is an guide to the standard SunOSTM 4.0 system software documentation set you receive with your Sun computer system. It is written for field support personnel, system administrators, users, and programmers. (This booklet does *not* describe the release-specific and platform-specific documentation.)

It is divided into seven chapters and one appendix:

1. Introducing Your SunTM System Software Documentation
2. Beginner's Guides
3. Reference Manuals
4. System and Network Administration Manuals
5. Programmer's Guides
6. SPARCTM Documents
7. Organizing and Researching your Sun System Documents

Appendix A contains a table of all manuals listed alphabetically.

Introducing Your Sun System Documents

This chapter has the following objectives:

- ❑ To present some basic concepts in understanding and using the standard system documentation
- ❑ To describe in a general way the shipping containers and packaging of the manuals when they arrive at your site
- ❑ To introduce and prepare for the following chapters (2 through 7)

The standard Sun software system documentation is organized into functional groups of manuals. The groups of manuals and the chapters in which they are described are as follows:

- | | |
|---------------------------------|-----------|
| ❑ Beginner's Guides | Chapter 2 |
| ❑ Reference Manuals | Chapter 3 |
| ❑ System Administration Manuals | Chapter 4 |
| ❑ Programmer's Guides | Chapter 5 |
| ❑ SPARC Documents | Chapter 6 |

Groups of Sun Software System Documentation

Sun System Users and their Documentation

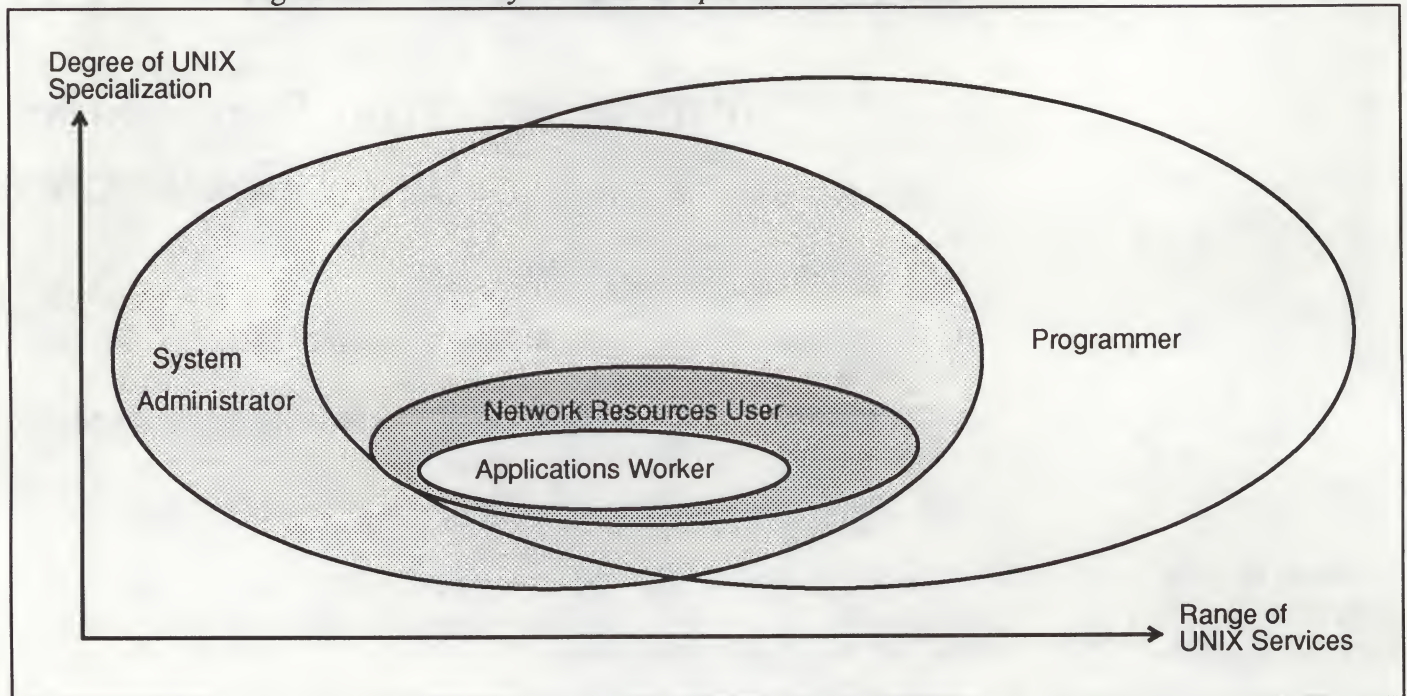
The very generic term "user" can apply to different types or levels of users including non-UNIX¹-specializing workstation users, network resource users, programmers, and network and system administrators. All these are "users" of the Sun system. In this document we try to specify the type of user. We do this so that you can identify your own needs with a particular category of documentation.

A particular audience is targeted for each group of manuals, but complete segregation of the material is impossible. The knowledge of Sun system software required by the different users sometimes overlaps. For example, programmers and system administrators often use the same services that non-specializing users do and in addition, more specialized SunOS and Sun system software features.

1. UNIX is a trademark of AT&T

The material covered in the above sequence of documentation groups is in ascending order of UNIX specialization. Figure 1-1 illustrates a concept of "users" based on degree and type of specialization in UNIX.

Figure 1-1 *Sun System Users' Specialization in UNIX*

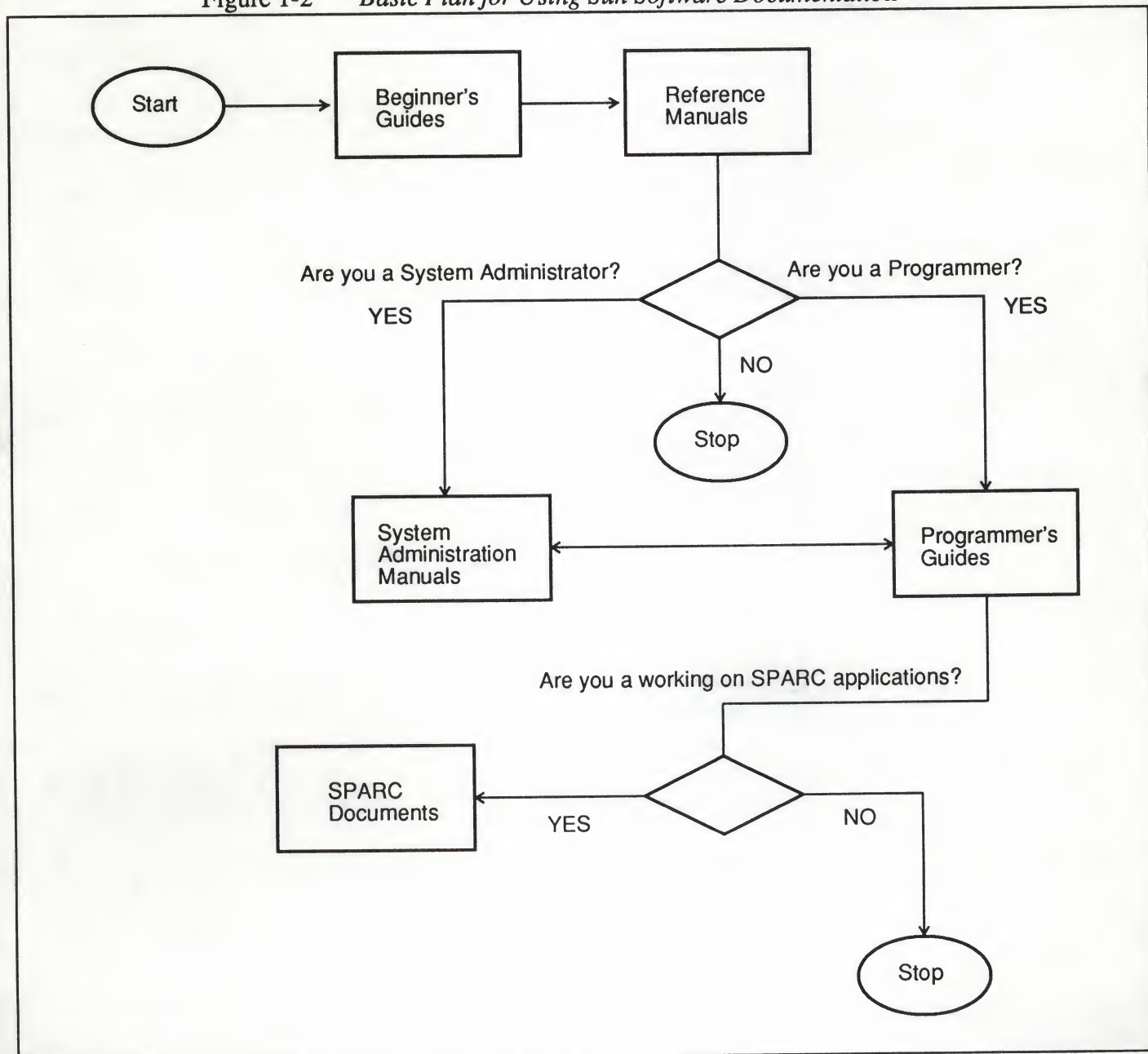


Where to Start with Your Sun Software Documentation

Figure 1-2 illustrates an exploration path to help route all users to the appropriate documentation. This is the path recommended even for experienced users. Of course, if you are experienced you can go faster and skip the material you are already familiar with.

Detailed example study plans for specific subjects are offered in Chapter 7, "Organizing and Researching Your Sun System Documents."

Figure 1-2 *Basic Plan for Using Sun Software Documentation*



How Sun Software Documentation Tracks SunOS Releases

Read This First (RTF) Booklets

Much of the Sun software documentation is applicable to a particular release version of the SunOS. Some manuals are updated only with major release versions of the SunOS. For intermediate releases, important changes in the standard documentation are covered in the release-specific documentation and in special "late edition" documents titled *Read This First*. The major release documentation must be interpreted in the light of the newer documents. Sometimes this new information may supersede information in the standard documentation.

As mentioned above, *Read This First* documents contain important late edition information that was became available only after the main manuals were published. Usually RTFs are targeted to a specific release version of the SunOS and may have the release version named in their titles. RTFs can contain installation instructions, documentation errata, and additions to the manuals they pertain to. They can also contain bug fixes and notices of known problems with the software.

There can be more than one RTF in a set of documentation. In fact, each manual or group of manuals can have its own RTF.

Special Features of the Sun Software Documentation

Sun system software documentation makes use of some special features to facilitate organization and access of the information contained in it. Some of these features are highlighted in this section. They are listed as follows:

- ☐ Individual tables of contents
- ☐ Global Index
- ☐ Color-coded tab dividers
- ☐ Quick Reference Guides
- ☐ Sun binders

Using the *Global Index*

Each book in the documentation set also contains its own index. In addition, a *Global Index* is included in the set of reference manuals. It contains entries that index subjects to all the books in the standard system software documentation. The *Global Index* is especially useful because many subjects are covered in more than one manual.

Tables of Contents

Each manual has a complete contents listing in the front of the manual. The contents provides a list of all chapter, section, and subsection heads, a list of tables, and a list of figures. In large manuals, each chapter has an individual contents pages at its beginning.

Using the Color-Coded Tab Dividers

Each manual has a tab cover with a large tab (3-1/2 inch) to separate it from the other manuals that may be included in the same binder. The larger manuals have additional sets of 2-1/2 inch tabs for each major section. These tabs are lettered in bold caps. Some manuals, for example, the *SunOS Ref-*

erence Manual, *Editing Text Files*, and *Formatting Documents* also have subsection tabs which are lettered in bold upper and lower case.

Tabs are color-coded to further facilitate convenient access and organization of the manuals in your library. For example, The *SunOS Reference Manual* has gray tabs; while the *Security Features Guide* has red tabs.

Sun Binders

Probably the best way to keep you Sun system software documentation set is to put them in a set of Sun binders. This facilitates easy access and reference. This suggestion is discussed further in the Chapter 7, "Organizing and Researching Your Sun System Documents."

Using Quick Reference Guides

There are three quick-reference guides and some other aids included loosely with your Sun software documentation set. The quick-reference guides are as follows:

- ☐ Getting Started with SunOS Quick Reference
- ☐ Doing More with SunOS Quick Reference
- ☐ Sun keycap adhesive labels

"Getting Started with SunOS" Quick Reference provides handy explanations of commands such as:

- ☐ Your work session
- ☐ Manipulating files
- ☐ Using your calendar
- ☐ Editing files with *vi*
- ☐ Formatting your files with *nroff*
- ☐ Searching with *grep*

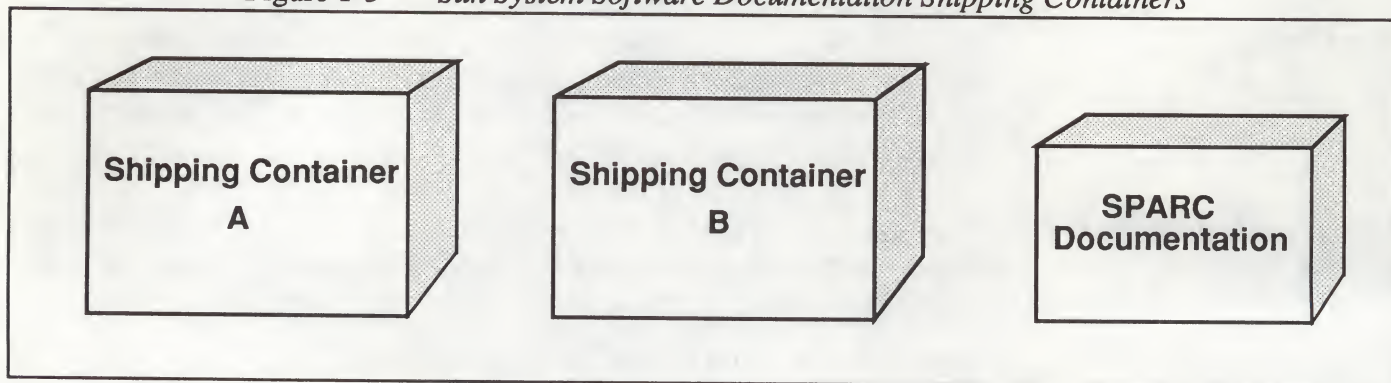
"Doing More with SunOS" Quick Reference provides some of the more frequently used, but also more advanced commands for files, pipes, filters, history substitution, and so forth.

The Sun keycap adhesive labels can be applied to the keys of nonstandard keyboards. (For more information, see *SunView 1 Beginner's Guide*, later in Chapter 2, "Beginner's Guides.")

Documentation Shipping Containers A and B

The standard system software is contained in two rather large shipping containers called A and B and one smaller box called the SPARC documentation box. Figure 1-3 illustrates the three boxes.

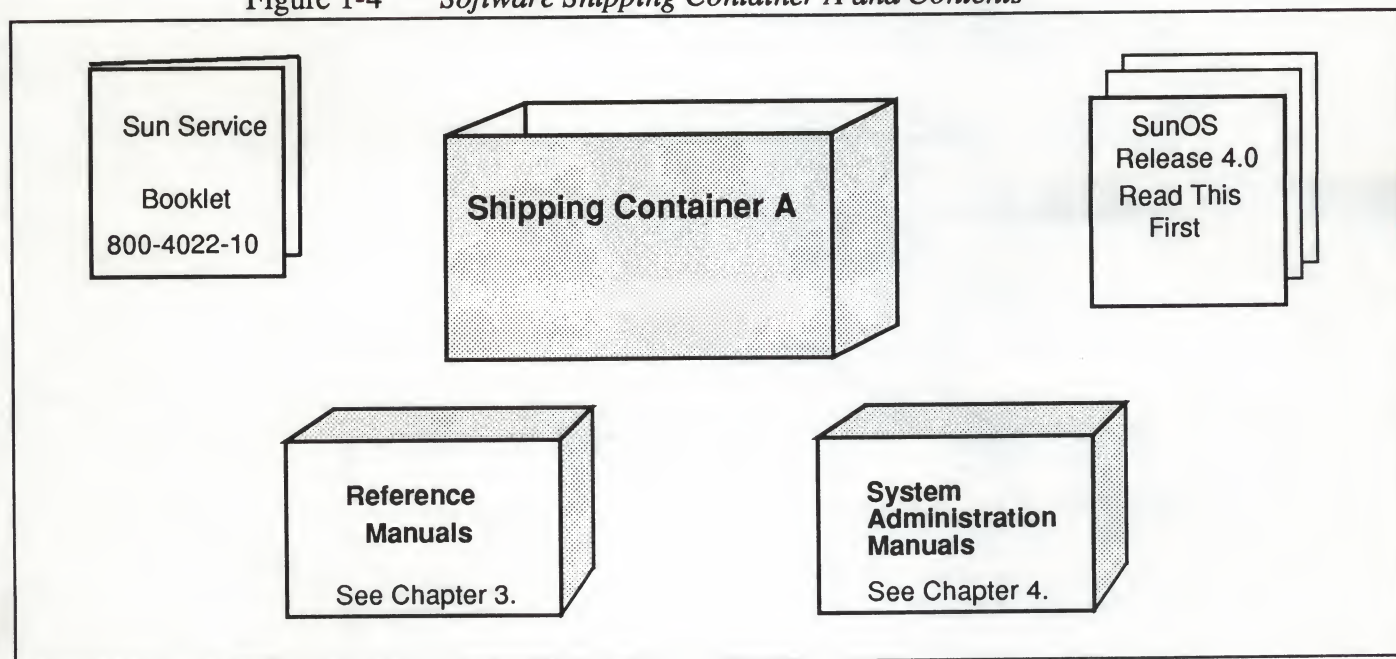
Figure 1-3 *Sun System Software Documentation Shipping Containers*



**Shipping Container A:
System Administration
and Reference Manuals**

Figure 1-4 illustrates the contents of system shipping container A. When you open it, you notice that it contains two loose documents on top of the two smaller boxes.

Figure 1-4 *Software Shipping Container A and Contents*

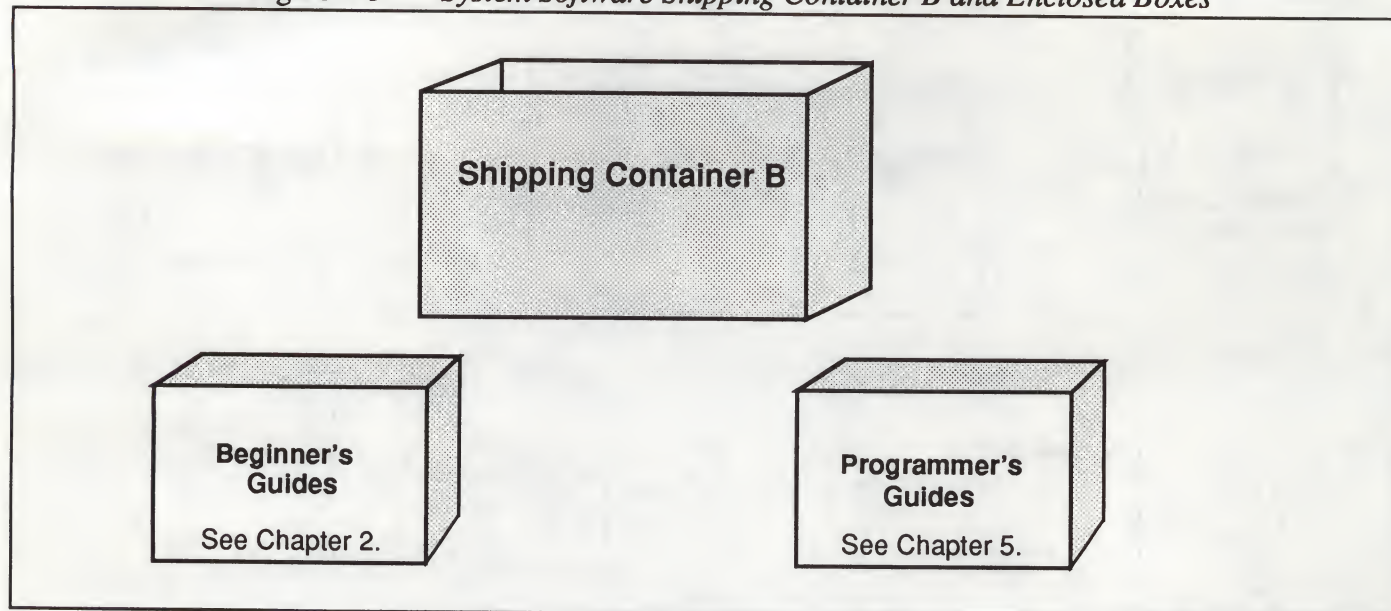


Shipping Container B: Beginner's Guides and Programmer's Guides

Figure 1-5 illustrates the contents of the software shipping container B, which contains two smaller boxes:

- ☐ 4.0 Beginner's Guides smaller box
- ☐ 4.0 Programmer's Guides smaller box

Figure 1-5 *System Software Shipping Container B and Enclosed Boxes*



Smaller Boxes

Shipping containers A and B each contain two smaller boxes. Figures 1-4 and 1-5 illustrate shipping containers A and B and their contents. The smaller boxes contain a particular class of manuals of the library of standard SunOS and Sun system software documentation

When you open a smaller box it is suggested that you:

1. Notice a list of contents printed on card stock and an RTF.
2. Check off the contents of the box against the list of contents.
3. Read the RTF and file it at the front of the corresponding manual or group of manuals in your Sun 3-ring binders.

How the Following Chapters are Organized

In the following chapters, the contents of the smaller boxes are illustrated as icons. Each icon contains the part number of the manual, which you can use if you are missing a manual or if you wish to order additional copies. Each manual is described briefly following the illustration.

Beginners Guides

Figure 2-1 illustrates the contents of the Beginner's Guides box. This series of manuals are an excellent starting point for a non-UNIX-specialized user or even an intermediate or advanced user who is becoming acquainted with a Sun system features for the first time. Except for two bound as saddle-stitched booklets, the Beginner's Guides series are perfect-bound books without tabs.

The manuals are illustrated and described in a suggested order for reading and study. They are listed as follows:

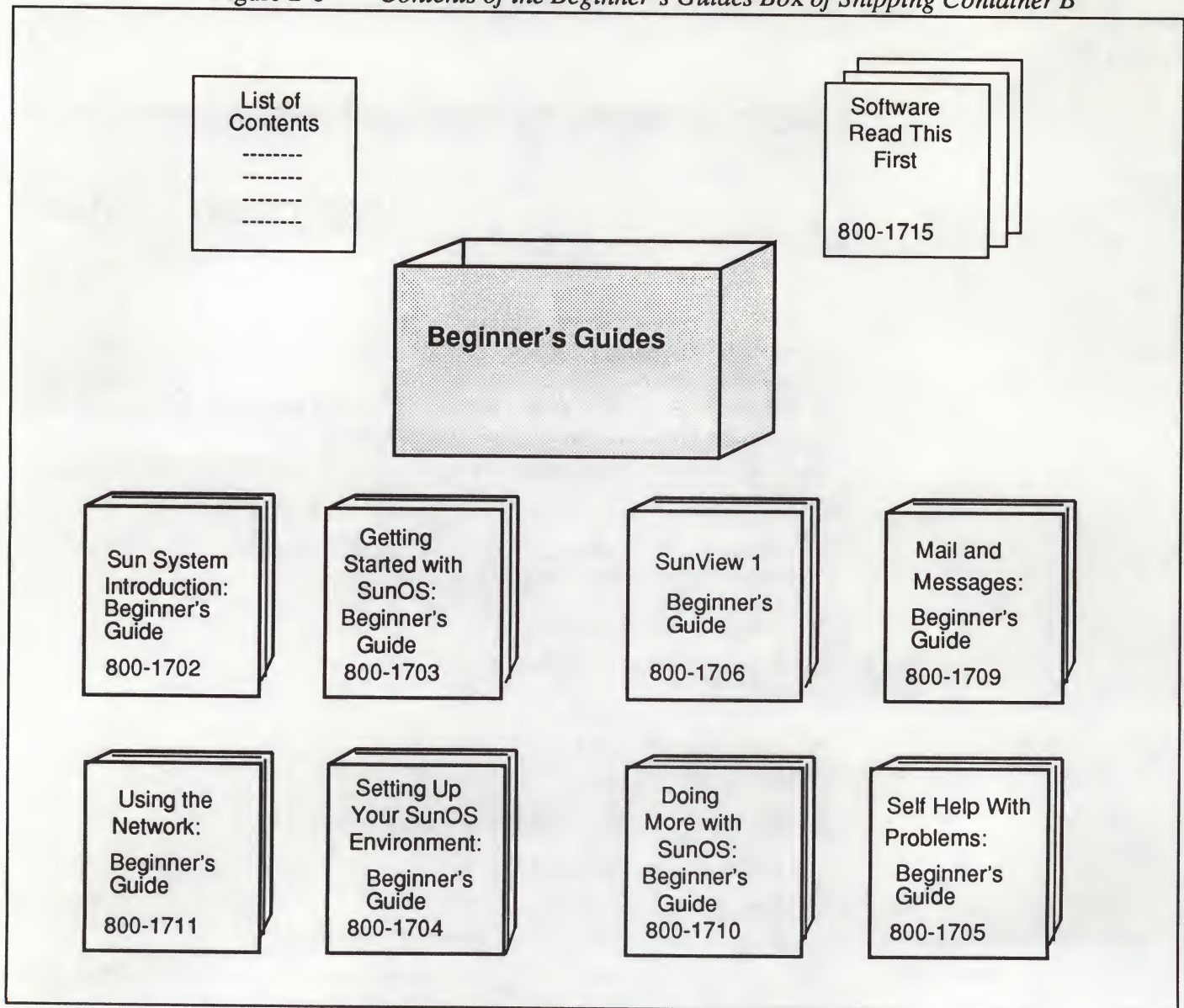
- ☐ *Sun System Introduction*
- ☐ *Getting Started with SunOS*
- ☐ *SunView™ 1*
- ☐ *Mail and Messages*
- ☐ *Using the network*
- ☐ *Setting Up Your SunOS Environment*
- ☐ *Doing More with SunOS*
- ☐ *Self Help with Problems*

Sun System Introduction

This manual is a survey of much of the Sun hardware and software product line. It is not a "how to" tutorial but a get-acquainted guide to what is available and where to find more information. It refers you to the appropriate manual for each subject covered.

You would want to read this book if you are thinking about purchasing a Sun system, if you just acquired a Sun system, or if you are new to the Sun environment. This might well be the first book you would want to read after your system is up and running and after you have read this *Guide to Sun System Software Documentation*. Some of the areas the *Sun System Introduction* covers are the following:

Figure 2-6 *Contents of the Beginner's Guides Box of Shipping Container B*



- ☐ Sun product family
- ☐ SunOS and networking
- ☐ SunView window environment
- ☐ Logging on and off your system
- ☐ Using shells and files
- ☐ Editing and formatting text
- ☐ System administration
- ☐ Software development
- ☐ Graphics software

- ❑ Unbundled and third party software

Getting Started with SunOS

This manual is an appropriately named guide to the basic tools you need to immediately begin using your workstation. It describes the keyboard, the terminal screen, mouse, the desktop windowing system, SunView, the SunOS file system. It provides getting-started basic information and tutorials for typing commands, editing, formatting, and searching files. It introduces timesaving features such as aliasing, on-line documentation (on-line Man Pages), a SunOS command summary, a glossary, and a bibliography. It also contains quick reference cards packed loose in the cover pages. The manual points you to more specialized Sun documentation for the subjects introduced.

SunView 1

This manual is combination lesson tutorial and reference manual for SunView, the SunOS desktop windowing environment. SunView provides a set of workstation tools, such as the virtual terminal shell tool. These tools are introduced in the manual. The manual provides reading and study paths within it for both beginners and experienced window system users.

Mail and Messages

This manual is devoted to the UNIX *mail* command and to the SunView Mail Tool, which is the SunOS intuitive user interface for UNIX *mail*. This manual also covers the interactive message programs *talk* and *write*.

This very thorough manual is as much a reference manual as a beginner's manual. It provides the basics and the more sophisticated aspects of using *mail* and Mail Tool, such as modifying your *.mailrc* file with the Defaults Editor and sending messages to recipients using *uucp* or the internetwork. *Getting Started with SunOS* and *SunView 1 Beginner's Guide* are prerequisites for reading this manual.

Using the Network

This manual provides basic introductory information on using the network facilities available on your workstation. These include NFSTM and the Sun on-line network database service. It covers remote logins, remote command execution, and dialup access. The book provides a command summary and glossary.

Setting Up Your SunOS Environment

This brief but powerful manual describes the setup files for the C shell command interpreter and the interactive editor *vi*. The manual defines "environment" as the various options and features that affect how the system or interactive program responds to you. It gives a sample set of files and provides the starting point for you to begin tailoring the system to your needs and style.

Doing More with SunOS

This manual describes some of the more sophisticated features of the SunOS and how to use them to simplify complicated tasks. Some of the rich details provided are:

- ☐ file attributes
- ☐ commands, pipes, and filters
- ☐ the C shell
- ☐ processes and concurrent tasks
- ☐ managing files
- ☐ printers, queues, and printing screen graphics

The appendices provide reference material on C shell special characters, Bourne shell scripts, and a command summary.

Self Help With Problems

This manual describes how to avoid and what to do about problems that can arise during normal use of the SunOS system and some of its utilities. (It does not cover system maintenance and troubleshooting, which are found in *System Network and Administration*.) It covers problems with logging in and out. It describes error messages that can occur for selected commands, when editing text files, and when networking.

Reference Manuals

Figure 3-1 illustrates the contents of the reference manuals box. This is a set of reference manuals for all types of users. The Reference manuals are listed as follows:

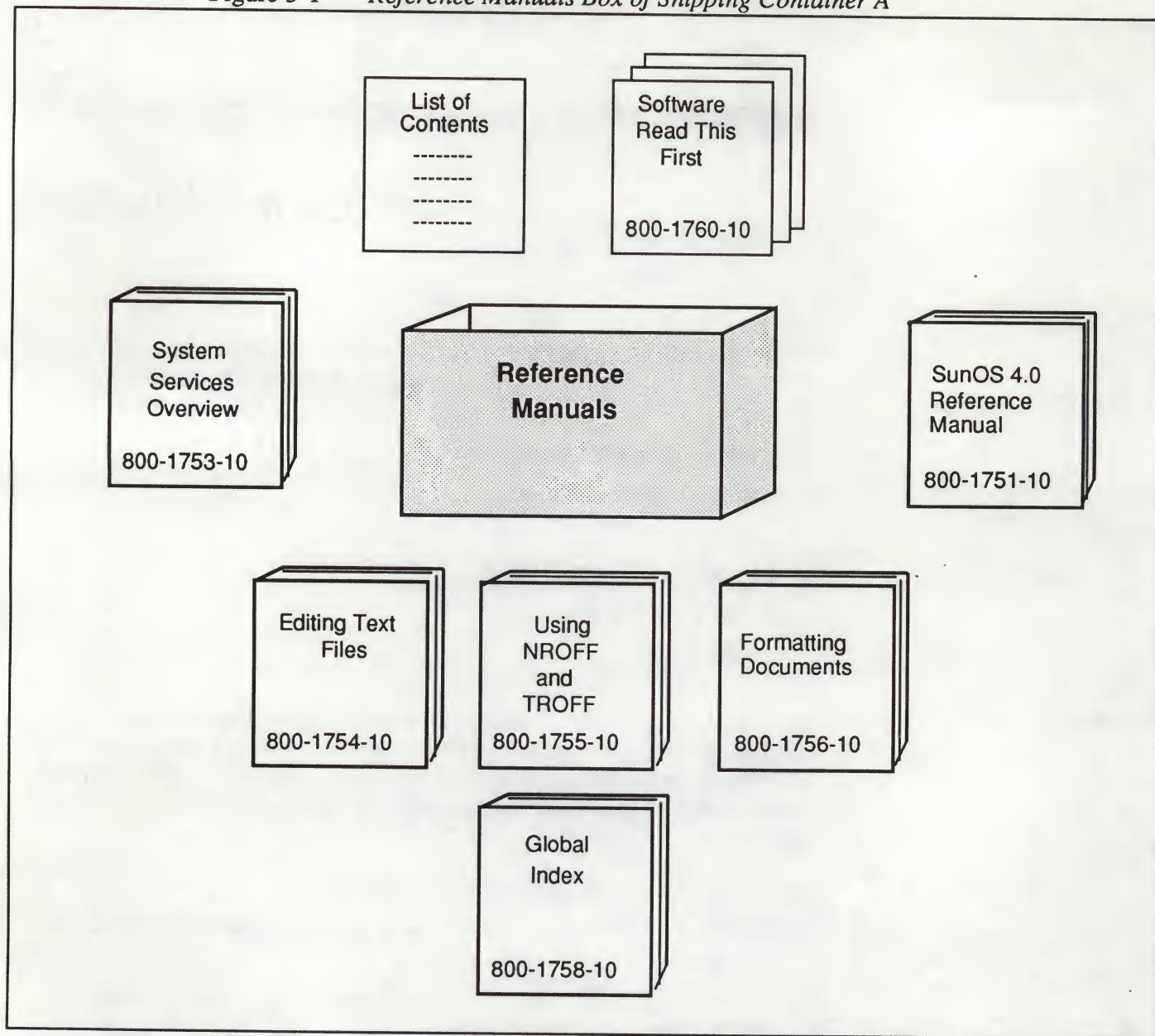
- ☐ *System Services Overview*
- ☐ *SunOS Reference Manual*
- ☐ *Editing Text Files*
- ☐ *Using NROFF and TROFF*
- ☐ *Formatting Documents*
- ☐ *Global Index*

System Services Overview

Pink Tab. This manual is an introduction to the facilities provided by SunOS. It can serve as a tutorial for the novice user, as a review and summary for an intermediate user of UNIX, and as a reference for UNIX specialists learning the SunOS implementation. Here are some of the subjects covered:

- ☐ System V¹ and BSD compatibility of SunOS
- ☐ SunOS kernel interface and virtual machine facilities, file access, and virtual device controllers
- ☐ Networking, including socket-based interprocess communication and server-based network services
- ☐ Memory management
- ☐ Lightweight processes (threads)

1. System V is a trademark of AT&T.

Figure 3-1 *Reference Manuals Box of Shipping Container A****SunOS Reference Manual***

Gray Tabs. This is a very large manual (more than 1,800 pages). It contains the SunOS version of the Berkeley UNIX "Manual Pages." Manual pages are alphabetically ordered sets of pages describing commands, functions, or other UNIX elements. (For more information on Man Pages, see *Getting Started with SunOS: Beginner's Guide*.) Each Man Page description is structured with a standard format convention that consists of categories similar to the following:

- ☐ Name
- ☐ Synopsis (command syntax)

- ☐ Availability on Sun platforms
- ☐ Description
- ☐ Option
- ☐ Flags (if any)
- ☐ Usage
- ☐ Example
- ☐ Files
- ☐ Bugs
- ☐ See Also

The manual is divided by numbered tabs into the sections as listed below. At the beginning of each section there is a alphabetical list of the elements contained in that section.

1. User commands (alphabetically listed descriptions)
2. System calls and error numbers
3. User-level C library functions
 - Lightweight processes library (threads)
 - Mathematical library of functions and constants
 - RPC service library functions and protocols
 - System V functions library
4. Devices, drivers, protocols and network interfaces
5. File formats used or read by various programs
6. Games and demos
7. Public files, tables, and TROFF macros
8. System maintenance and operations commands

Editing Text Files

Light Green Tabs. The introduction of this manual offers a tutorial on using the editors provided by SunOS. A chapter is devoted to each editor: *vi*, *ex*, *ed*, and *sed*. Other chapters cover searching, viewing, and comparing files.

Using NROFF and TROFF

Dark Green Tabs. This manual is a tutorial and reference manual for NROFF and TROFF, the standard UNIX text formatting and type setting processors. TROFF works by reading dot-(.) commands and escape sequences which you embed in your screen edit file. This manual divides the commands into functional and logical groups such as: line format, page layout, line spacing and character size, and so forth. The book also contains appendices containing command summaries, number registers, and other reference material. A full set of tabs helps to make this a handy reference book.

Formatting Documents

Medium Green Tabs. This manual covers special formatting packages that work in conjunction with TROFF. Included are: families of text formatting macros, the indexing tool, *refer*, table formatting, equation setting, and verification programs. A full set of tabs make this a handy reference book.

Global Index

White Tab. This manual is an extensive interbook index for the entire library of Sun software documentation. It is essentially a two-column table with topical entries pointing to a "Where to Look" field consisting of the manual title and page number. It begins with a special character index and proceeds with the alphabetical entries.

System Administration Manuals

Figure 4-1 illustrates the contents of the System administration manuals box. System Administration manuals, as you might expect from the title, are designed as reference and instruction manuals to aid system administrators perform their duties of installing, configuring, and maintaining a Sun system environment; however, sections of these manuals can be useful or are especially directed to users and programmers.

The System Administration Manuals are listed as follows:

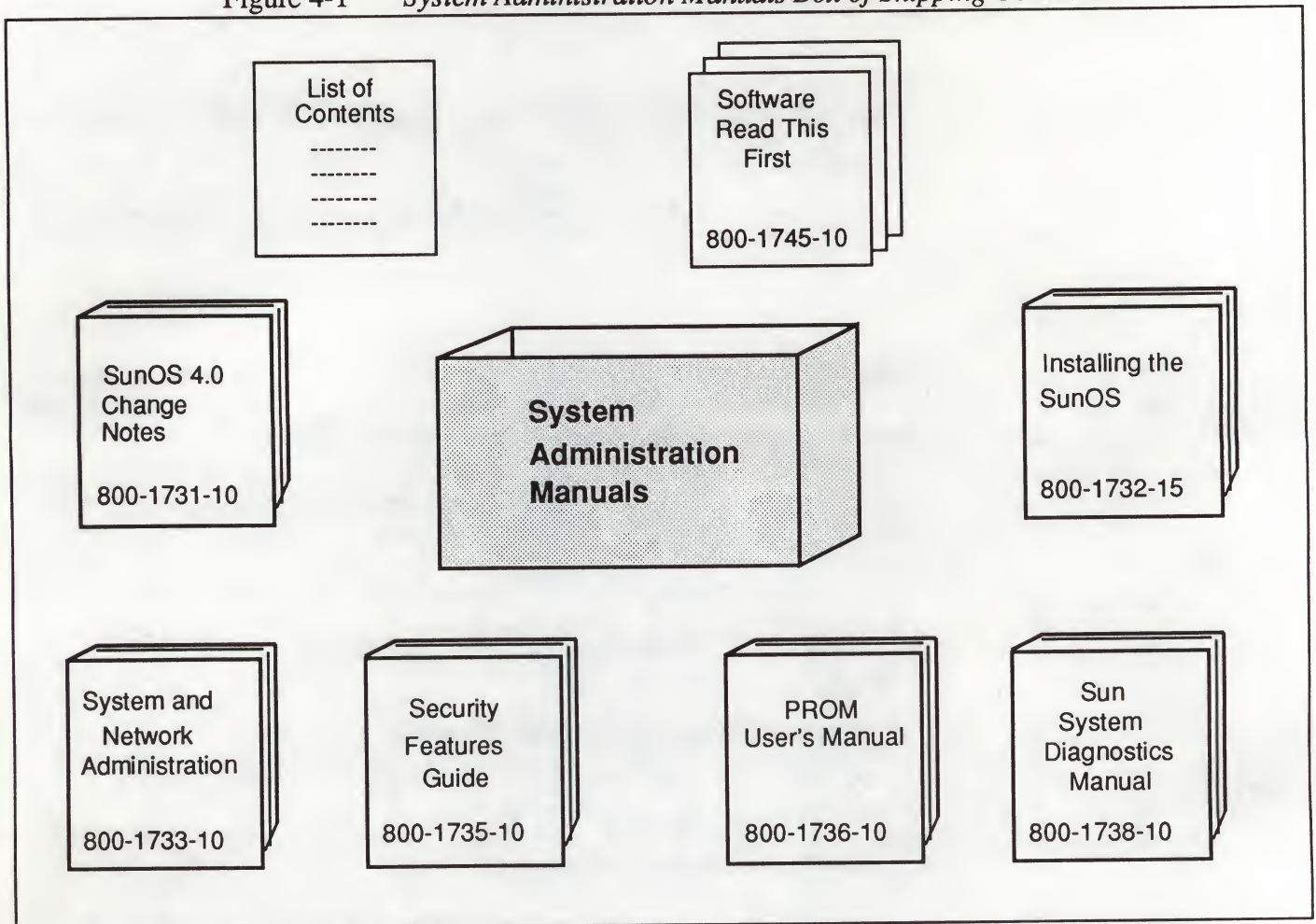
- ☐ *SunOS 4.0 Changes Notes*
- ☐ *Installing the SunOS*
- ☐ *System and Network Administration*
- ☐ *Security Features Guide*
- ☐ *PROM User's Manual*
- ☐ *Sun System Diagnostics Manual*

SunOS 4.0 Change Notes

Yellow Tabs. This manual is written for system administrators, programmers, and users migrating from SunOS 3.x to 4.0. The manual reviews compatibility, unbundled software availability, changes, and enhancements between the release versions. For those beginning to use SunOS 4.0 and above, the manual may be helpful in highlighting current advances in SunOS.

Installing the SunOS

Yellow Tabs. This manual is the installation manual for SunOS 4.0 and is *not* needed to install SunOS 4.0.3 release. However it contains reference and background information that may be useful to all users in complementing knowledge contained in the current release and installation manuals and in learning installation concepts. Subjects include: SunInstall™, directory structures, loading tapes, machine types, remote installations, installation for different platform configurations, and reconfiguring the kernel.

Figure 4-1 *System Administration Manuals Box of Shipping Container A*

System and Network Administration

Orange Tabs. This manual is a resource manual for learning and managing Sun systems at SunOS 4.0 and higher. It provides procedures, explanations, terminology, tutorials, and information on disk maintenance, reconfiguring the kernel, adding hardware, and using the *format* utility.

The networking chapters provide information on network administration, NFS™, Sun on-line network database service, and electronic mail. The reference part includes tutorials and explanations of advanced UNIX administration and networking subjects such as mail routing, printing configuration, *termcap*, *uucp*, and the name server.

Security Features Guide

Red Tabs. This manual is a comprehensive tutorial and guide to most aspects of Sun system and network electronic security, from passwords to viruses. It includes special sections for users, programmers, and administrators.

PROM User's Manual

Brown Tabs. This manual describes the types of PROMs found in Sun systems and what they do. Types of PROMs are boot , diagnostic, ID, and system configuration PROMs. A chapter is provided on Sun386i™ self-tests and initialization. Hardware implementation PROMs are not covered in this manual.

Sun System Diagnostics Manual

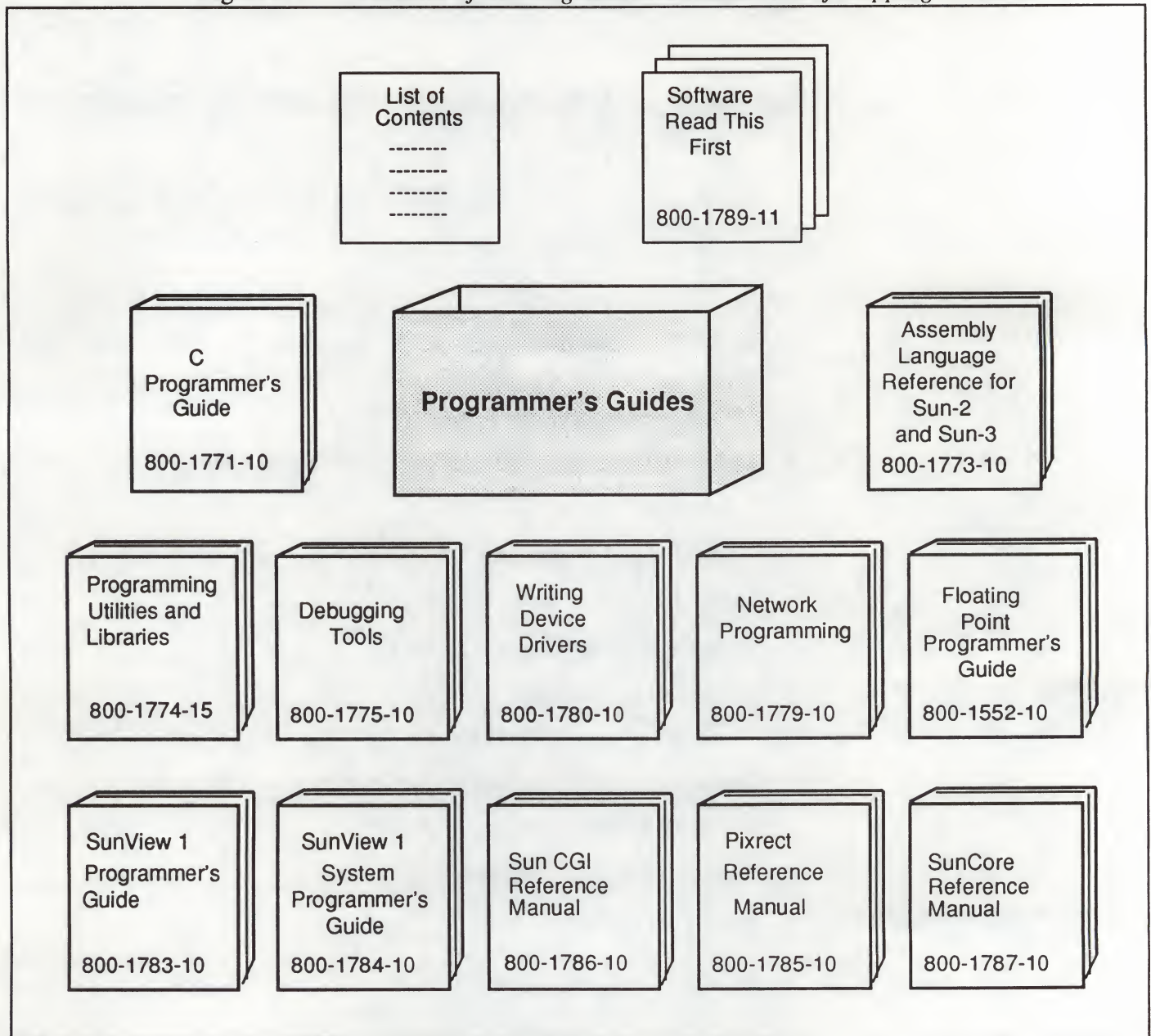
Brown Tab. This manual is a guide to the interactive Sun System Diagnostic test system, *sysdiag*. Running under SunOS, the program *sysdiag* tests memory, disk and tape drives, boards, and board-level devices. (This manual applies only to SunOS releases prior to 4.1. Releases from 4.1 upwards are shipped with *Sundiag*™. See the *Sundiag User's Guide* shipped in the 4.0.3 Release Box.)

Programmer's Guides

Figure 5-1 illustrates the contents of the Programmer's Guides box. The Programmer's Guides are listed in logical order as follows:

- ☐ *C Programmer's Guide*
- ☐ *Assembly Language Reference for Sun-2™ and Sun-3™*
- ☐ *Debugging Tools*
- ☐ *Floating Point Programmer's Guide*
- ☐ *Network Programming*
- ☐ *Programming Utilities and Libraries*
- ☐ *Writing Device Drivers*
- ☐ *SunView 1 Programmer's Guide*
- ☐ *SunView 1 System Programmer's Guide*
- ☐ *Pixrect™ Reference Manual*
- ☐ *Sun CGI™ Reference Manual*
- ☐ *SunCore™ Reference Manual*

Figure 5-1 Contents of the Programmer's Guides Box of Shipping Container B



C Programmer's Guide

Purple Tabs. This manual describes how to write C programs that interface with SunOS. Such programs include those that use files by name; that use pipes; that invoke commands as they run; or that catch interrupts and other signals during execution. Prerequisites are:

- ☐ Knowledge of C up to the level described in *The C Programming Language*, by Kernighan and Ritchie, Prentice-Hall, 1978
- ☐ Familiarity with SunOS as exemplified in *SunOS Reference Manual*

Although not definitive, this manual provides the basics on the following aspects:

- ☐ Using the Sun C compiler
- ☐ Accessing a Program's Environment
- ☐ Processes and signals
- ☐ Standard I/O, character I/O
- ☐ String and character handling

Several appendices provide reference tables including Sun386i data representation.

Assembly Language Reference for Sun-2 and Sun-3

Purple Tabs. This manual describes syntax and usage of the assembler for some of the microprocessors used in Sun workstations and servers and Sun's FPA. The basic format of the assembler is based on the DEC¹ Macro-11 assembler, UNIX PDP-11² assembler, and Motorola³ mnemonics and address format.

Prerequisites are familiarity with the basics of assembly language and the relevant processors.

Subjects covered are:

- ☐ Notation, elements of the assembly language, and expressions
- ☐ Assembly language program layout
- ☐ Assembler directives, instructions, and addressing modes

Appendices document error codes, opcodes, and FPA Assembler Syntax.

Debugging Tools

Purple Tabs. This manual describes three Sun debuggers: *dbx*, *dbxtool*, and *adb*. The manual is written for programmers experienced with C, assembler, FORTRAN, Modula-2 or Pascal.

dbx is an interactive, line-oriented, source-level, symbolic debugger. *dbxtool* is a window-based interface to *dbx*. *adb* is an interactive, line-oriented, assembly-level debugger. The first two are adequate for most debugging tasks. The latter is used for more advanced tasks, such as interactive examination of binary files and debugging the kernel. Chapters on *adb* include tutorials, a reference, debugging SunOS kernels, and generating scripts.

Floating Point Programmer's Guide

Purple Tabs. This manual describes features of various Sun floating-point implementations, their use, options, numerics, performance, and conformance to IEEE standards.

1. DEC and Macro-11 are trademarks of Digital Equipment Corporation

2. PDP-11 is a trademark of Digital Equipment Corporation

3. Motorola is a trademark of Motorola, Inc.

You should be familiar with the ANSI/IEEE standard, the Motorola FPA, or the Weitek¹ chip set, according to your interests. This manual lists an extensive bibliography for further study. Numerous appendices provide reference material not easily obtainable elsewhere.

Network Programming

Red Tabs. SunOS is structurally a network UNIX system that can adapt to changing network technology. Chapter 1 of this manual provides an extensive overview of the network services provided by SunOS, such as, NFS, pipes, sockets, network commands, Sun on-line network database service, and network managers and monitors.

The chapters that follow are divided into three parts:

- ☐ Network programming using Remote Procedure Calls (RPCTM) and XDR²
- ☐ Protocol specifications for XDR, RPC, and NFS
- ☐ Socket-based Interprocess Communications (SunIPCTM)

Programming Utilities and Libraries

Orange Tabs. This manual, written primarily for applications programmers, provides an overview of SunOS programming environment and describes system facilities, utilities, and libraries supported by that environment. The manual is largely derived from BSD documents.

The manual is organized into groups of chapters describing the following topics:

- ☐ System interface and support facilities for C programming
- ☐ C programming aids to check for correctness and to monitor performance
- ☐ System utilities for version control and compilation
- ☐ Program generation tools
- ☐ BSD and System V³ *curses* terminal-display library routines

Appendices describe low-level commands for SCCS and enhancements to the *make* utility.

Writing Device Drivers

Dark Blue Tabs. This manual is a guide to adding drivers for new hardware devices to the SunOS kernel. The manual is divided into three parts:

- ☐ Regular device drivers (non-STREAMS)

1. Weitek is a trademark of Weitek Corp.

2. XDR is a trademark of Xerox Corp.

3. System V is a trademark of AT&T.

SunView 1 Programmer's Guide

- ❑ **STREAMS programming.** This part describes the construction and installation of STREAMS drivers and modules, and provides pertinent reference material.
- ❑ **Non-STREAMS appendices.** The appendices summarize the available device driver routines, kernel support routines, and user support routines. One appendix contains sample driver listings.

Light Blue Tabs. This manual is written for applications programmers writing programs that run under SunView. SunView is an object-oriented system to support interactive, graphics-based applications running within windows. The manual assumes the reader understands C. *SunView 1 Beginner's Guide* is a prerequisite. It complements the *SunView System Programmer's Guide* described below.

This manual is organized as a combination tutorial, user's guide, and reference manual. Chapters are devoted to operational concepts such as the SunView model, an overview of the user interface resources, using windows, handling input and the following objects in the interface toolkit:

- ❑ Windows, frames, canvases, Pixwins, text subwindows panels
- ❑ Menus, the notifier, cursor, icons, Alerts, TTY subwindows
- ❑ Scrollbars, the selection service, attribute utilities

An interface elements summary is provided in one of the chapters. The appendices provide example programs, Sun user interface conventions, and a reference section on converting SunWindows™ programs to SunView.

SunView 1 System Programmer's Guide

Light Blue Tabs. This manual follows much of the structure and topics of the programmer's guide described above, but from the point of view of how Sun View works on the inside, that is, the building blocks on which the application level is built and advanced application-related features.

This manual is designed as a reference backup to the *SunView 1 Programmer's Guide*, which is a prerequisite. It provides a perspective and information on how to properly structure your applications so that lower-level details are buffered from higher level layers.

Chapters are devoted to the following topics:

- ❑ Windows, desktops, workstations, selection service and library
- ❑ Advanced notifier usages, menus and prompts
- ❑ User defaults database, advanced imaging, rects and rectlists

Appendices provide a reference tutorial on writing a virtual user input device driver and information on libraries, error messages, and debugging.

Pixrect Reference Manual

Pink Tabs. This manual describes the *Pixrect* graphics library, which is a set of routines that manipulate rectangular arrays of pixel values. These routines, called *RasterOps*, are common to all Sun workstations. Application programs use these *RasterOps* to manipulate bit-mapped displays.

The chapters of the manual describe the major features of the *Pixrect* library:

- ☐ Portability, *Pixrect* operations
- ☐ Text facilities, *Pixrect* memory
- ☐ File I/O facilities

Appendices describe writing a *Pixrect* driver, functions and macros, data structures, and curved shapes.

Sun CGI Reference Manual

Pink Tabs. SunCGI is an implementation of ANSI Computer Graphics Interface (CGI). This manual is a user and reference manual for the applications programmer of SunCGI applications. The manual assumes you are familiar with interactive computer graphics and C. The chapters of the manual cover the following topics:

- ☐ Initializing and terminating
- ☐ Output, attributes, and input

The appendices provide reference material, several example programs that can be used as templates for applications, guides for using SunCGI with *Pixwins* and *FORTTRAN* programs, and short C bindings.

SunCore Reference Manual

Pink Tabs. SunCore is an implementation of the ACM SIGGRAPH Core System. This manual is a user and reference manual for the applications programmer of SunCGI applications. The manual assumes you are familiar with interactive computer graphics and C.

The chapters of the manual cover the following topics:

- ☐ Program control
- ☐ Viewing operations and coordinate transforms
- ☐ Segmentation and naming
- ☐ Output primitives, attributes, and input primitives

The appendices provide reference material, several example programs that can be used as templates for applications, and guides for using SunCore with *Pascal* and *FORTTRAN* programs.

SPARC Documents

This chapter reviews the SPARC system software documentation set you receive with your Sun computer system. Figure 6-1 illustrates the contents of the SPARC documentation box. The SPARC document set is written primarily for system and applications programmers who are engaged in developing and porting applications to a SPARC system.

The SPARC documents are:

- ☐ *SPARC 4.0 Release Notes*
- ☐ *A RISC Tutorial*
- ☐ *Porting Software to SPARC Systems*
- ☐ *SPARC-4™ Assembly Language Reference Manual*

SPARC Release Notes for 4.0

White Tab. The introduction of this manual summarizes the features of the 32-bit SPARC architecture and the types of applications it supports. Chapter 2 covers the features of the SPARC release such as:

- ☐ Changes to the system
- ☐ Running languages on the system
- ☐ Graphics enhancements
- ☐ SunView enhancements

Other chapters are devoted to:

- ☐ PROM monitor commands
- ☐ Sun-4 Test System
- ☐ EEPROM layout

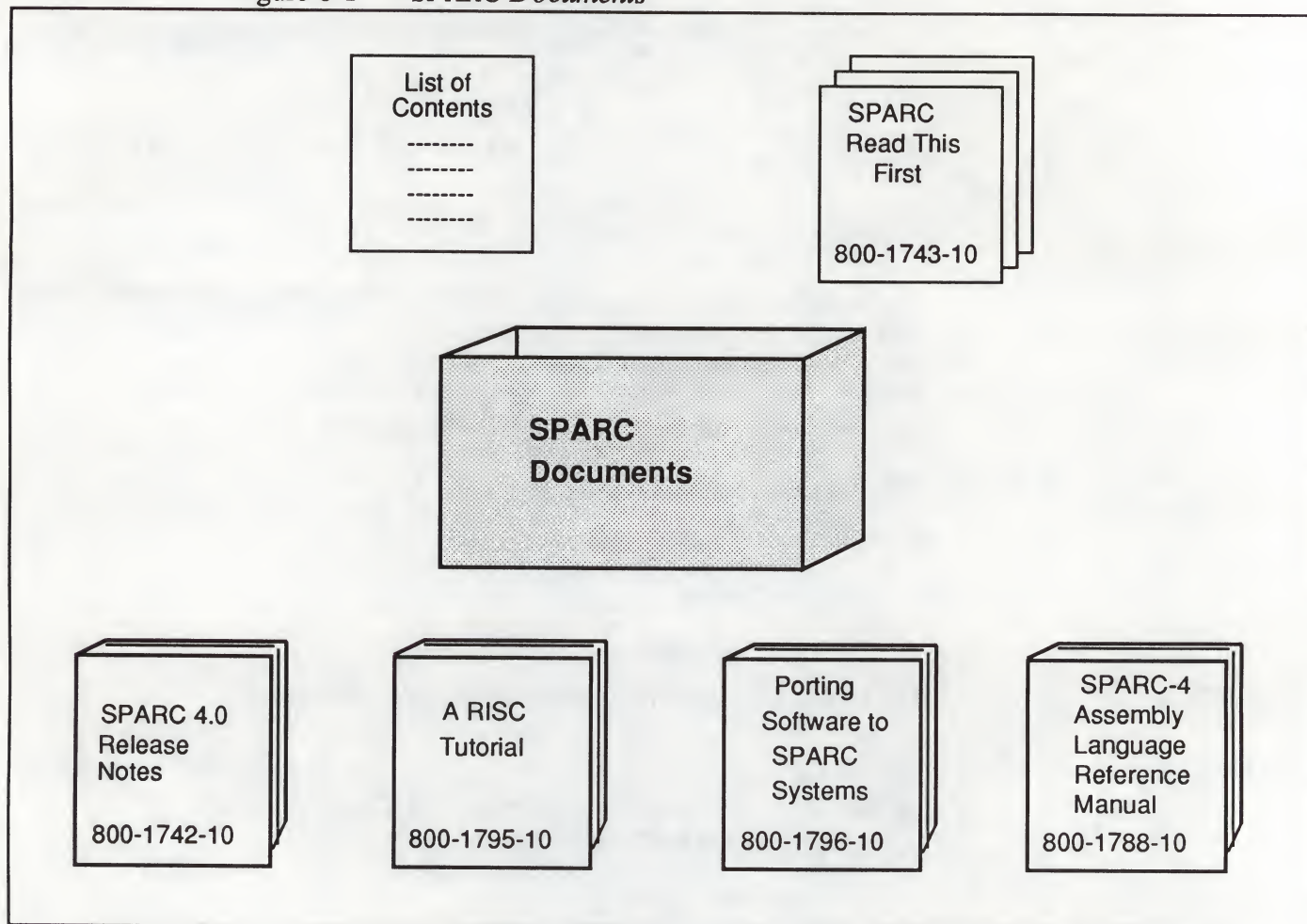
An appendix provides an example configuration file.

A RISC Tutorial, Sun Microsystems®, Inc.

White Tab. This booklet talks about SPARC architecture under its important aspects of RISC architecture and open systems architecture. The book-

let introduces the basic concepts and describes the advantages and special implementations of SPARC architecture.

Figure 6-1 *SPARC Documents*



Porting Software to SPARC Systems

White Tab. This manual briefly describes the machine level SPARC architecture, porting C, FORTRAN, and Pascal programs to a SPARC system. This manual and the following manual refer the reader to the *SPARC Processor Architecture Manual* (P/N 800-1399) for more information on SPARC machine-level architecture and the SPARC instruction set.

SPARC-4 Assembly Language Reference Manual

White Tab. This manual briefly describes the SPARC assembler syntax, instruction set mapping. It provides tables summarizing instruction set mapping and pseudo-operations. An appendix describes the assembler command and its operations.

Organizing and Researching Your Sun System Documents

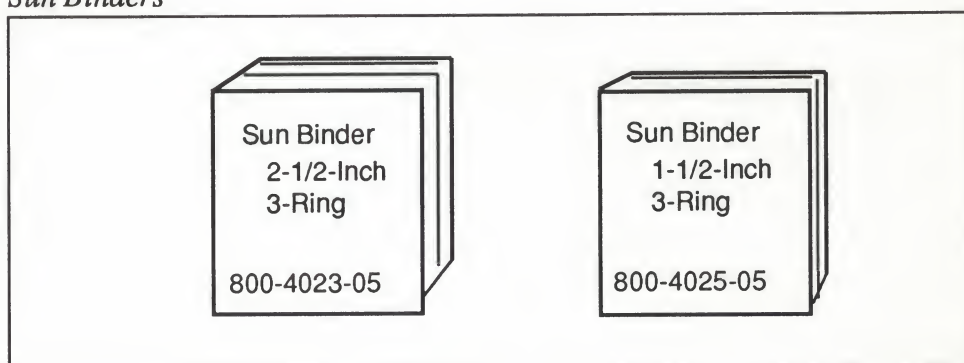
This chapter contains a sample plan for organizing your Sun software documents in binders and offers sample research and learning paths to follow some typical topics through your Sun software documentation. Plans are presented for learning about the following:

- ☐ Files
- ☐ SunOS commands
- ☐ Editing and formatting text
- ☐ System and network administration
- ☐ Application systems programming

Organizing Your Library of Sun System Documentation

The best way to keep your Sun software documentation set may be to put the individual manuals into binders. There are two sizes of 3-ring binders that are particularly useful for this purpose. They are available from Sun. The binders have spine sleeves into which you can insert card stock labels naming the contents of the binders. The binders are silk-screened with a three-color design and the Sun logo. Figure 7-1 illustrates these two binders.

Figure 7-1 *Sun Binders*



Sun Binder Set

A preplanned binder set is also available for the Sun-3™, Sun-4, and SPARC system documentation. It consists of 14 binders including four 1-inch, two 1-1/2-inch, and eight 2-inch binders. The binders include the appropriate spine labels. The order number of the set is BINDER-PKG-SS.

Table 7-1 shows an example of how one might organize the Sun manuals into these binders. This is only an example to get you started. Everyone will probably want their own arrangement.

The table includes the reference manuals, the system and network administration manuals, and the programmer's manuals. Since the manuals have initial manual title tabs, you can move the manuals around to find an arrangement that is most comfortable to you.

Except for two, beginners guides are perfect bound and are 3-hole drilled. You can write or affix labels to the spines and place them on your bookshelf or place them in binders. The two that are pamphlet style, you can place in a 1-1/2-inch Sun binder.

Table 7-1 Example Sun Library in Binders

<i>Size of Binder</i>	<i>Title of Manual</i>
1-1/2-inch	<i>SPARCserver 390 Release Manual</i> <i>SunOS 4.0.3 Release Manual</i> <i>Installing the SunOS 4.0.3</i>
1-1/2-inch	<i>SunOS Change Notes</i> <i>Installing the SunOS</i>
2-1/2-inch	<i>System Services Overview</i> <i>System and Network Administration</i>
2-1/2-inch	<i>Security Features Guide</i> <i>Sun System Diagnostics Manual</i> <i>PROM User's Manual</i>
2-1/2-inch 2-1/2-inch 2-1/2-inch	<i>SunOS Reference Manual: 3 volumes</i> Vol. 1 of 3: 1. User Commands Vol. 2 of 3: 2. System Calls, 3. Library Function, 4. Devices and Networking Vol. 3 of 3: 5. File Formats, 6. Games and Demos, 7. TROFF Macros and Misc. Tables, 8. Maintenance Commands
2-1/2-inch	<i>Editing Text Files</i> <i>Using NROFF and TROFF</i> <i>Formatting Documents</i>
1-1/2-inch	<i>Global Index</i>
2-1/2-inch	<i>C Programmer's Guide</i> <i>Assembly Language Reference Guide</i> <i>Debugging Tools</i> <i>Floating Point Programmer's Guide</i>
2-1/2-inch	<i>Programming Utilities and Libraries</i>
1-1/2-inch	<i>Network Programming</i>
2-1/2-inch	<i>Writing Device Drivers</i>
2-1/2-inch	<i>SunView 1 Programmer's Guide</i>
1-1/2-inch	<i>SunView 1 System Programmer's Guide</i>
2-1/2-inch	<i>Pixrect Reference Manual</i> <i>Sun CGI Reference Manual</i> <i>SunCore Reference Manual</i>
1-1/2-inch	<i>SPARC 4.0 Release Notes</i> <i>A RISC Tutorial</i> <i>Porting Software to SPARC Systems</i> <i>SPARC-4 Assembly Language Reference Manual</i>

Learning about Specific Subjects

Many subjects are covered in different manuals of the Sun software documentation and to varying degrees of depth and detail. A complete course of study in a subject entails starting with the basics and progressing to more advanced material. Therefore, a study and reading plan takes parts of or entire books from among the entire Sun documentation set and orders them in a progressive sequence.

The following subsections are sample research and learning paths. You can make your own paths by looking up a subject in the *Global Index* and listing the entries in the order from most basic to more difficult.

System and network administrators and programmers who are learning the SunOS system should not skip over the beginners guides. These guides provide a good perspective and overview for anyone who is introducing themselves to the Sun system environment.

The plans are arranged as a tables with entries broken down to the chapter and manual title. Entries are in the order recommended for reading.

Learning About Files

Since SunOS (and UNIX) are file-oriented operating systems, one might begin with a plan for learning about the SunOS file system and file manipulation.

Table 7-2 *Study Plan for Learning About Files*

<i>Book Title</i>	<i>Chapter</i>
<i>Sun System Introduction</i>	<i>Ch. 7 Working With Files</i>
<i>Getting Started with SunOS</i>	<i>Ch. 4 Files and the File System</i>
<i>Getting Started with SunOS</i>	<i>Ch. 8 Searching Through Files</i>
<i>Doing More with SunOS</i>	<i>Ch. 2. More About Files</i>
<i>Doing More with SunOS</i>	<i>Ch. 6 Managing Your Files</i>
<i>SunOS Reference Manual</i>	<i>Sec. 7 Public Files, Tables, and TROFF Macros</i>
<i>SunOS Reference Manual</i>	<i>Sec. 5 File Formats</i>

**Learning to Use SunOS
Commands**

This study and reading plan lists the books and chapters covering SunOS commands.

Table 7-3 *Study Plan for Learning SunOS Commands*

<i>Book Title</i>	<i>Chapter</i>
<i>Sun System Introduction</i>	<i>Ch. 5 Using Shells</i>
<i>Sun System Introduction</i>	<i>Ch. 6 User Access and Commands</i>
<i>Getting Started with SunOS</i>	<i>Ch. 5 Commands</i>
<i>Getting Started with SunOS</i>	<i>Ch. 9 Timesaving Features</i>
<i>Getting Started with SunOS</i>	<i>Ap. A Command Summary</i>
<i>Using the Network</i>	<i>Ch. 2 Login Access to Other Machines</i>
<i>Using the Network</i>	<i>Ch. 3 Mounting Remote File Systems</i>
<i>Using the Network</i>	<i>Ch. 4 Issuing Commands to Remote Machines</i>
<i>Using the Network</i>	<i>Ap. A Command Summary</i>
<i>Doing More with SunOS</i>	<i>(all chapters and appendices)</i>
<i>Getting Started with SunOS</i>	<i>Ch. 10 OnLine Documentation</i>
<i>SunOS Reference Manual</i>	<i>(all sections)</i>

**Learning to Edit and
Format Text**

This study and reading plan lists the books and chapters covering editing and formatting text especially aimed at the use of TROFF.

Table 7-4 *Study Plan For Editing and Formatting Text*

<i>Book Title</i>	<i>Chapter</i>
<i>Sun System Introduction</i>	<i>Ch. 8 Editing Text Files</i>
<i>Sun System Introduction</i>	<i>Ch. 9 Formatting Documents</i>
<i>Getting Started with SunOS</i>	<i>Ch. 6 Editing Files</i>
<i>Getting Started with SunOS</i>	<i>Ch. 7 Formatting Files</i>
<i>SunView 1 Beginner's Guide</i>	<i>Ch. 1 Using the Text Editor</i>
<i>SunView 1 Beginner's Guide</i>	<i>Ch. 11 All About Tools</i>
<i>Doing More with SunOS: Beginner's G.</i>	<i>Ch. 7 More About Printing (Files)</i>
<i>Editing Text Files</i>	<i>(Reference Manual)</i>
<i>Using NROFF and TROFF</i>	<i>(Reference Manual)</i>
<i>Formatting Documents</i>	<i>(Reference Manual)</i>
<i>SunOS Reference Manual</i>	<i>Sec. 7 Public Files, Tables, and TROFF Macros</i>

Learning System and Network Administration

This study and reading plan lists the books and chapters covering the duties of a system and network administrator.

Table 7-5 Study Plan For a System and Network Administrators

Book Title	Chapter
<i>Sun System Introduction: Beginner's G.</i>	<i>Ch. 11 SunOS Internal Features</i>
<i>Sun System Introduction: Beginner's G.</i>	<i>Ch. 12 System Administration</i>
<i>Setting Up Your SunOS Environment</i>	<i>(all chapters)</i>
<i>SunView 1: Beginner's Guide</i>	<i>Ch. 10 Using the Defaults Editor</i>
<i>Self Help with Problems: Beginner's G.</i>	<i>(all chapters)</i>
<i>Using the Network: Beginner's Guide</i>	<i>(all chapters)</i>
<i>Mail and Messages: Beginner's Guide</i>	<i>(all chapters)</i>
<i>System Services Overview</i>	<i>(all chapters)</i>
<i>System and Network Administration</i>	<i>(all chapters)</i>
<i>Security Features Guide</i>	<i>(all chapters)</i>
<i>SunOS Reference Manual</i>	<i>Sec. 8 Maintenance Commands</i>
<i>Sun Systems Diagnostics Manual</i>	<i>(all chapters)</i>
<i>PROM User's Manual</i>	<i>(all chapters)</i>
<i>Installing the SunOS</i>	<i>(all chapters)</i>

Learning the SunOS System for Programmers

This study and reading plan lists the books and chapters introducing the Sun programming environment to application systems programmers.

Table 7-6 Study Plan For Application System Programmers

Book Title	Chapter
<i>Sun System Introduction: Beginner's G.</i>	<i>Ch.11 SunOS Internal Features</i>
<i>Sun System Introduction: Beginner's G.</i>	<i>Ch 5 Using the Shells</i>
<i>Doing More with SunOS: Beginner's G.</i>	<i>Ch. 4 The C Shell</i>
<i>Doing More with SunOS</i>	<i>Ch. 6 Managing Your Files</i>
<i>Sun System Introduction: Beginner's G.</i>	<i>Ch. 13 Software Development</i>
<i>Sun System Introduction: Beginner's G.</i>	<i>Ch. 14 Graphics Software</i>
<i>Sun System Introduction: Beginner's G.</i>	<i>Ch. 15 Unbundled and Third Software</i>
<i>System Services Overview</i>	<i>(all chapters)</i>
<i>SunOS Reference Manual</i>	<i>(applicable chapters)</i>
<i>Programming Utilities and Libraries</i>	<i>(all chapters)</i>
<i>Programmer's manuals</i>	<i>(applicable manuals)</i>

Alphabetic Document Descriptions

This appendix contains a table listing the software documents you receive with your Sun computer system. The entries are arranged alphabetically for your convenience. The last column of the table refers to the chapter of this booklet in which the manual is described. The table does not include RTFs.

Table A-1 *Alphabetic List of Sun System Software Documents*

<i>Title</i>	<i>Chapter</i>
<i>Assembly Language Reference for Sun-2 and Sun-3</i>	5
<i>The C Programming Language</i>	5
<i>C Programmer's Guide</i>	5
<i>Debugging Tools</i>	5
<i>Doing More with SunOS: Beginner's Guide</i>	2
<i>Editing Text Files</i>	3
<i>Floating Point Programmer's Guide</i>	5
<i>Formatting Documents</i>	3
<i>Getting Started with SunOS: Beginner's Guide</i>	2
<i>Global Index</i>	1, 3
<i>Installing the SunOS</i>	4
<i>Mail and Messages: Beginner's Guide</i>	2
<i>Network Programming</i>	5
<i>Pixrect Reference Manual</i>	5
<i>Porting Software to SPARC Systems</i>	6
<i>Programming Utilities and Libraries</i>	5
<i>PROM User's Manual</i>	6
<i>A RISC Tutorial</i>	6
<i>Security Features Guide</i>	4
<i>Self Help With Problems: Beginner's Guide</i>	2
<i>Setting Up Your SunOS Environment: Beginner's Guide</i>	2
<i>SPARC Architecture Manual</i>	6
<i>SPARC Release Notes</i>	6
<i>Sun-4 Assembly Language Assembly Language Reference Manual</i>	5
<i>Sun System Diagnostics Manual</i>	4
<i>Sun System Introduction: Beginner's Guide</i>	2
<i>SunCGI Reference Manual</i>	5
<i>SunCore Reference Manual</i>	5
<i>SunDiag User's Guide</i>	4
<i>SunOS Reference Manual</i>	3
<i>SunOS 4.0 Change Notes</i>	4
<i>SunView 1: Beginner's Guide</i>	2
<i>SunView 1 Programmer's Guide</i>	2

Table A-2 *Alphabetic List of Sun System Software Documents (continued)*

<i>Title</i>	<i>Chapter</i>
<i>SunView 1 System Programmer's Guide</i>	5
<i>System and Network Administration</i>	4
<i>System Services Overview</i>	4
<i>Using NROFF and TROFF</i>	3
<i>Using the Network: Beginner's Guide</i>	2
<i>Writing Device Drivers</i>	5

Revision History

Dash Number	Revision	Date	Comments
10	A	September 26, 1989	Initial Release

Guide to Sun System Software Documentation READER COMMENT SHEET

Dear Reader,

We who work at Sun Microsystems wish to provide the best possible documentation for our products. To this end, we solicit your comments on the *Guide to Sun System Software Documentaion*, Part Number 800-3855. We would appreciate your telling us about errors in the content of the manual, and about any material that you feel should be there but isn't.

Typographical Errors

Please list typographical errors by page number and actual text of the error.

Technical Errors

Please list errors in technical accuracy by page number and actual text of the error.

Content

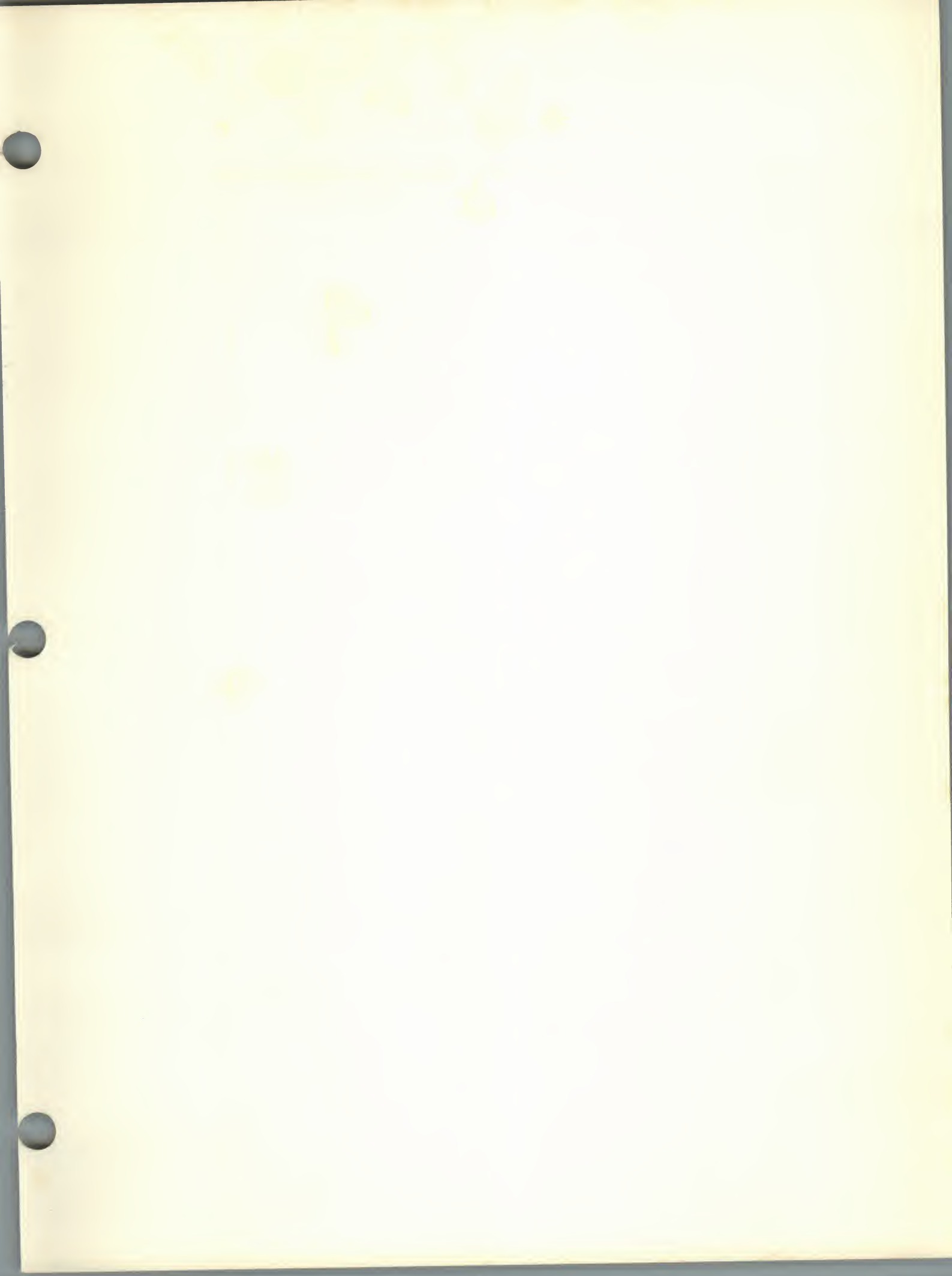
Did this guide meet your needs? If not, please indicate what you think should be added or deleted in order to do so. Please comment on any material that you feel should be present but is not. Is there material found in other manuals that would be more convenient if it were in this manual?

Layout and Style

Did you find the organization of this guide useful? If not, how would you rearrange things? Do you find the style of this manual pleasing or irritating? What would you like to see different?

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